

# **CHAPTER 1. INTRODUCTION**

## **1.1 PURPOSE AND SCOPE**

The Energy Policy and Conservation Act (P.L. 94-163), as amended by the National Appliance Energy Conservation Act of 1987 (P.L. 100-12), by the National Appliance Energy Conservation Amendments of 1988 (P.L. 100-357), and by the Energy Policy Act of 1992 (P.L. 102-486), sets energy conservation standards for various products<sup>1</sup> and authorizes the Secretary of Energy to prescribe amended or new energy standards for each type (or class) of covered product.

This document assesses the economic impacts of trial standards for fluorescent lamp ballasts according to the criteria in the Energy Policy and Conservation Act. The assessment includes: an engineering analysis of the price and performance of technology options to improve the efficiency of ballasts, estimates of the number and average efficiency of ballasts sold, the amount of energy ballasts will consume, their prices and operating expenses, a calculation of the costs and benefits of efficiency standards to consumers, electric utilities, and the nation as a whole, an assessment of the environmental impacts of the trial standard levels, and a regulatory impact analysis.

This report contains units compliant with Le Systeme International d'Unités (SI or metric system) and traditional English units. Many SI units, such as watts (W), are familiar in the contexts in which the reader will find them; others are not. This change is made in compliance with Section 5164 of the Trade and Competitiveness Act of 1988, Executive Order 12770 of 1991, and DOE Order 5900.2.

## **1.2 STRUCTURE OF THE DOCUMENT**

This document consists of seven chapters, four appendices, and a Regulatory Impact Analysis.

Chapter 1      Introduction: outlines the structure of the document.

Chapter 2      Analytic Approach: summarizes the methodology used in the analysis, discusses the components of the analysis and their interrelationships, describes the models used, their data requirements and their outputs, and identifies the primary assumptions of

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<sup>1</sup> The products covered in the legislation are: refrigerators, refrigerator-freezers, and freezers; room air conditioners; central air conditioners and central air-conditioning heat pumps; water heaters; furnaces; dishwashers; clothes washers; clothes dryers; direct heating equipment; kitchen ranges and ovens; pool heaters; television sets; fluorescent lamp ballasts; general service fluorescent lamps and incandescent reflector lamps; showerheads; faucets; water closets; urinals; electric motors; pumps; small and large commercial package air conditioning and heating equipment, packaged terminal air conditioners and heat pumps; warm air furnaces; packaged boilers; storage water heaters; instantaneous water heaters; and unfired hot water tanks.

the analysis. This chapter also provides an overview of the methodology used to examine the sensitivity of the results to changes in the key assumptions, parameters, and exogenous forecasts used in the analysis.

- Chapter 3      Engineering Analysis: contains detailed energy use, price, and efficiency information for each lamp/ballast combination analyzed.
- Chapter 4      Life-Cycle Costs and Payback Periods: describes the effects of trial standard levels on individual purchasers and users of fluorescent lamp ballasts. It compares ballast life-cycle cost and other measures of consumer impact with and without standards. The sensitivity of the life-cycle cost and payback period to assumptions made in the analysis is also examined here. A consumer subgroup analysis describes life-cycle cost and payback period results for users who switch from T12 to T8 lamp systems.
- Chapter 5      National Energy and Economic Impacts: describes national forecast of energy consumption, efficiency of new ballasts, ballasts already installed in commercial and industrial buildings, electricity price forecasts, and annual ballast sales in the absence (or presence) of standards. Discusses the choice of the standards scenarios to be analyzed and the projected impacts of each level. Results are reported for several scenarios in which the projected market share of magnetic ballasts as well as the electricity price forecast are varied. The chapter summarizes energy savings, sales, equipment costs, and operating costs of ballasts, as well as the net present benefit of the trial standard levels. It also contains estimates of the net national employment impact from changes in energy use, the increased cost of more efficient ballasts and energy cost savings from their use.
- Chapter 6      Impacts of Trial Standards on Manufacturers and Suppliers: estimates the financial impact of standards on manufacturers and suppliers and the impacts on competition, employment, and manufacturing capacity.
- Chapter 7      Impacts of Trial Standards on Electric Utilities: describes the effects of trial standard levels on the electric utility industry, focusing on the change in electricity sales, in generation and installed capacity.
- Appendix A    Engineering Analysis Supporting Documentation: Presents documentation for the LBNL Life-Cycle Cost (LCC) spreadsheet model. Gives supporting data and calculations for model inputs: wattages, end-user prices, annual lighting hours, and labor costs. Presents the development of national electricity price projections.
- Appendix B    National Energy Savings Supporting Documentation: presents documentation for the LBNL National Energy Savings (NES) spreadsheet model. Gives supporting data on ballast shipments and ballast market scenarios and discusses the effect of non-regulatory programs on the ballast market. Presents the calculation method for lighting/HVAC interactions. Presents marginal electricity price methodology.

Appendix C Manufacturers and Suppliers Impacts Analysis

Appendix D Environmental Impact: Describes the changes in emissions of carbon and nitrogen oxides from combustion of fossil fuels for electricity generation that would result from trial standards.

Appendix E This supplemental appendix contains analyses performed after stakeholders agreed to consensus efficiency standards for fluorescent lamp ballasts. The consensus standards apply to ballasts for the new and renovation market (sold as part of a fixture in the OEM market) manufactured as of April 1, 2005, sold by manufacturers as of July 1, 2005, and incorporated into luminaires by luminaire manufacturers as of April 1, 2006.

Regulatory Impact Analysis: Presents major alternatives to proposed standards that could achieve some portion of the energy savings achieved by standards.